Tijdschrift voor Economie en Management
Vol. XLVII, 1, 2002

How to Survive in the Network Economy? An Overview of the Ideas of Prof. Carl Shapiro and Prof. Hal R. Varian

by H. VANDER BAUWHEDE*

Vander Bauwhede Heidi
Department of Applied
Economics, K.U.Leuven

ABSTRACT

In this text, Heidi Vander Bauwhede reports on the reflections offered by Professor Hal Varian at the occasion of the third seminar, 2000-2001, on 'E-conomics of Trust' of the PwC Chair *Value and Risk*. The new network economy differs in various respects from the old economy. Hence, some call for a new economic framework that helps us explain the new, information economy. Professors Carl Shapiro and Hal R. Varian argue however that the phenomena of the network economy can be explained by existing, but less well-known economic principles. This article lists those principles and discusses the implications for designing successful business strategies in the network economy.

* Heidi Vander Bauwhede is postdoctoral researcher at the KULeuven. The article is basically a summary of the book "Information Rules" by Carl Shapiro and Hal R. Varian (1999).

I. INTRODUCTION

The network economy seems at first glance totally different from the old economy. The widespread economic principles taught in basic economics courses are unable to explain what is going on in the new economy. Some argue therefore that we need a totally new economic framework. By contrast, Carl Shapiro and Hal R. Varian (1999) argue in their book "Information Rules. A Strategic Guide to the Network Economy" that existing, but less well-known, economic principles can help us understand the new economy and can help us design business strategies to survive in it. According to Shapiro and Varian (1999) the economic principles they discuss will remain relevant as the economy changes further.

Business strategies of producers and sellers of both information and information technology have to be tailored to the specific characteristics of their goods. The aim of this article is then also twofold. The first objective is to give an overview of the characteristics of information and information technology and of the relevant economic framework that can help us explain the new economy. The second objective is to provide some guidelines to design winning business strategies for the network economy.

The remainder of the article is structured as follows. In section II we discuss the characteristics of *information* and its consequences for business strategies. We present the characteristics of information *technology* and its implications for decision making in section III. Section IV indicates the role of the government and regulation in the information market and section V concludes.

II. CHARACTERISTICS OF INFORMATION AND CONSEQUENCES FOR BUSINESS STRATEGIES

Information has the following two important characteristics. First, it is costly to produce, but cheap to reproduce. That is, information is a good with high fixed costs but low marginal costs. Information is thus a good with substantial (supply-side) economies of scale. A second characteristic of information is that it is an *experience good.* Consumers must experience information to value it. Information is even a very specific experience good, in the sense that it is an experience good *every time you consume it.* Take for example a newspaper. Every day, you can only know whether the journal is worth buying once you have read (that is, consumed) it.

The cost-structure of information and its "experience-good character" imposes the following challenges and opportunities on you as information provider.

Pricing information: value-based pricing and price differentiation. The specific cost structure of information implies a specific pricing strategy. It makes no sense that you, as information provider, price through a mark-up on cost, because the cost of the first copy is perhaps substantial, but the cost of additional copies is about zero. Instead of pricing information to production cost, you should price information according to consumer value (value-based pricing). This implies price differentiation.

There exist various forms of price differentiation. Personalized pricing (first-degree price differentiation or perfect price discrimination), versioning (second-degree price differentiation) and group pricing (third-degree price differentiation). Personalized and group pricing involves differentiation based on individual customer and group characteristics, respectively. Versioning involves offering a whole product line and charge consumers different prices for different versions of the good.

The key to successful product and pricing differentiation is customer information, which is far easier to achieve in the information economy. You can, for example, easily get demographic information on your customers by asking them to register before they can get access to information on your web-site. You can then use this information in differentiating your products and prices.

The experience good problem. The experience good nature of information faces the information sellers with the "experience good problem", namely: What is the optimal trade-off between giving your information away to convince consumers to buy your product and recovering your costs of information production? An important recommendation is that you break your goods in components and only give away part of your product.

Managing intellectual property. Since information is easy to reproduce, it is also easy to copy. While this makes rights management more difficult, it also offers new opportunities to owners of intellectual rights. Relatively low distribution and reproduction costs of information make it, for example, easy and cheap to let customers try your product. Also you should keep in mind that there is a natural limit to the extent of illegal copying in an environment with well-performing enforcement mechanisms of intellectual property. The rationale is that illicit copying

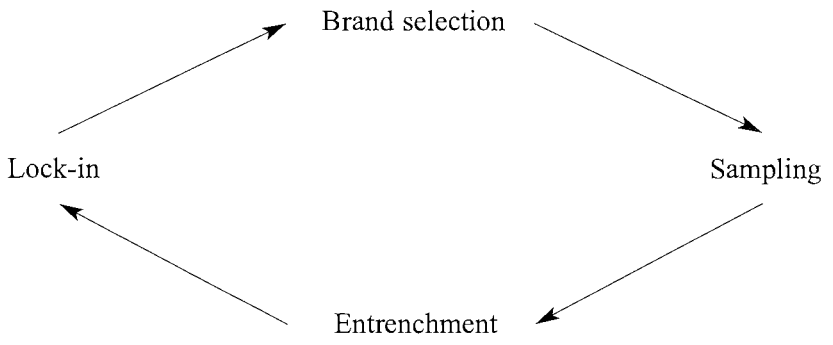
on a large scale in such an environment makes the likelihood of being caught greater. In addition, remember that the goal is not *protection* of your intellectual property but *maximizing the value* of it.

III. CHARACTERISTICS OF INFORMATION *TECHNOLOGY* AND CONSEQUENCES FOR BUSINESS STRATEGIES

Switching costs and lock-in. A first characteristic of information technology is that its users are subject to *switching costs* and *lock-in. Switching costs* may arise if you buy various *complementary* (compatible) assets (with different lifetimes). You not only buy hardware, but also the software that goes with it. Therefore, if you change technologies, you may have to change both assets. For example, if you change from Intel to Apple technology you not only have to change your hardware, but also your software. You will even have to update your "wetware", that is your knowledge of how to use the hardware and software. *Lock-in* occurs if switching costs are substantial.

Switching costs are not static, but change throughout time. Also, you are not *born* locked-in but can *become* locked-in by, for example, buying complementary investments to an existing asset. Shapiro and Varian ((1999) p. 132) developed a diagram, the lock-in cycle, (see Figure 1) to let you think dynamically about lock-in.

FIGUUR 1
The Lock-In Cycle



(Source: Shapiro and Varian (1999), p. 132)

At the brand selection point, customers choose between alternative technologies. During the sampling phase, customers actually try the brand they have chosen, and hereby profit from various inducements (sweeteners). You can think of this phase as, for example, customers using a free sample. You enter the entrenchment phase if the customer sticks to the brand, develops a preference for it, and becomes perhaps locked-in by investing in various complementary assets. You are back at the brand selection point if the customer *considers* switching or actually switches brands.

Switching costs and lock-in may be costly for you as a buyer *and* as a seller of information technology. Understanding the concepts of switching costs and lock-in is crucial for developing strategies to make switching costs and lock-in work to your advantage. Shapiro and Varian (1999) describe some of those basic strategies. One of their most important arguments is that you (either as buyer or seller) should evaluate the consequences of a decision over the entire lock-in cycle.

The basic strategy for the *buyer* to minimize switching costs and lock-in includes the following two tactics (Shapiro and Varian (1999), p. 136):

- "Bargain hard at the outset of the lock-in cycle for a sweetener or some form of long-term protection before you become locked in".
- "Take steps to minimize your switching costs during the lock-in cycle".

"Sweeteners" can come in form of additional discounts on hardware, an extended warranty, support in switching from your previous system, free upgrades for some period of time... Important is that you negotiate for this kind of "sweeteners" *before* you get locked-in because your bargaining power is at that moment largest.

You may follow various tactics to bargain for sweeteners. Those tactics include:

- Convincing the suppliers that changing systems will be costly and that your current system, and that of your colleagues or competitors, still works properly;
- Convincing the suppliers that you are an attractive customer (that is worth a discount) because you need follow-on purchases;

- Convincing the supplier that you can influence other potential customers;
- Convincing that you will bear very high switching costs later in the lock-in cycle. (Note however that the latter strategy may be a tricky business because a possible consequence is that you become subject to monopolistic charges.)

The basic strategy for *suppliers* to deal with lock-in is (1) to invest in an installed base of customers, (2) aim for customer entrenchment and (3) maximize the value of your installed base by selling complementary products to loyal customers and by selling access to these customers to other suppliers (Shapiro and Varian (1999), p.142).

Since the market for information services is characterized by perfect competition, you will have to compete and invest heavily in an installed base. Lock-in will however allow you to gain substantial operating margins on your installed base, so that the net result will be a normal rate of return on your investments.

Network externalities, network effects and demand side economies of scale. A second characteristic of information technology products is that they exhibit *network externalities or network effects*. This means that the value of information technology products (for example, communication technology products such as telephones, e-mail and fax machines) typically depends on how many other users there are. This also implies *collective* switching costs when changing from one technology to another. As a producer of information technology, your survival chances will depend on whether you are able to achieve *the demand side economies of scale* generated by network effects. That is, you will have to reach critical mass *or* you will have to become the standard. You can either compete to become the standard yourself, or you can cooperate with rivals to establish standards. Either way, you will have to take into account that *positive feedback* is crucial for the successful introduction of a product with network externalities. Consumer expectations and expectations' management are critical in this process. If consumers *expect* you to become the standard, you *will* become the standard. Those characteristics again call for appropriate business strategies.

In order to ignite positive feedback, you will have to make two choices. The *first* choice is whether you will make your technology

compatible with the existing one *or* whether you will build an entirely new but far better performing technology. The former allows customers to switch more easily between technologies ("evolution-approach") than the latter, which rests on the hope that your technology is that performant that enough customers are willing to bear the huge switching costs ("revolution-approach"). Both approaches have their own risks. The "evolution approach" involves that you will have to overcome technical and legal obstacles. The *technical* obstacle involves that you will have to develop a technology that is at the same time compatible with and yet superior to existing products. The *legal* obstacle involves that you will need the right to sell products that are compatible with other products. Risks of the "revolution approach" are that you need a big performance advance, which is inherently difficult to measure because technologies follow an S-shaped or logistic growth pattern. Also, it cannot work on a small scale and you need a powerful group of strategic partners that support your technology (Shapiro and Varian (1999), p.196).

A *second* choice you will have to make is whether you will choose for an "open approach" by offering the necessary interfaces and specifications available to others, or whether you try to keep control by keeping your system proprietary. Your objective is to maximize the value of your technology. The value of your technology equals your share of the industry value. The "open approach" aims at maximizing the total value added to the industry, while the "control approach" aims at maximizing your share of the industry. Which one of the two approaches is the better one for you will depend on how strong you are to ignite positive feedback on your own. Note that intermediate approaches can be used as well.

Given the two choices you have to make, you will end-up in one of four generic strategies for companies seeking to introduce new information technology into the market place (p.203) (see Table 1): Controlled migration, open migration, performance play or discontinuity. If two players in a market with incompatible technologies are engaged in a battle to build their own new networks (a standards war) then the nature of the battle will depend on the pair of generic strategies employed by the combatants.

TABLE 1

Generic Network Strategies

	Control	*Openness*
Compatibility	Controlled migration	Open migration
Performance	Performance play	Discontinuity

Source: Shapiro and Varian (1999), p. 204.

IV. THE GOVERNMENT'S INFORMATION POLICY

The information sector is likely subject to the government's anti-trust policy and regulation. Knowledge of the government's information policy, and taking this policy into account when developing and implementing business strategies may be crucial for surviving in the network economy.

V. CONCLUSION

This article presents a short overview of the major characteristics of information and information technology and its implications for business strategy. The major characteristics of information are its cost structure (high fixed, but low marginal costs) and its experience good character, which have consequences for pricing strategies, rights management and marketing strategies. It is, for example, recommendable to differentiate your prices, to maximize the value of your intellectual property rather than to protect your intellectual property and to provide free samples to attract customers.

The major characteristics of information *technology* are that it imposes switching costs on the customers and that it exhibits network effects or network externalities. Major lessons are that you, as either buyer or seller of information, should evaluate the consequences of a decision over the entire lock-in cycle, and that consumers expectations are critical in igniting positive feedback in order to achieve critical mass and demand side economies of scale.

Finally, knowledge of the government's information policy and taking this into account when developing business strategies may be critical to survive in the network economy.

REFERENCES

R.Shapiro, Carl and Hal R. Varian, 1999, Information Rules. A Strategic Guide to the Network Economy, (Harvard Business School Press, Boston Massachusetts).

Varian, Hal R., 2001, Economic Forces in the Network Economy, *Economic Directions* 11, 2, (Center for Economic & Policy Education), 1-8. (Saint Vincent College, Latrobe).